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ANNUAL REPORT
OF
THE DIRECTOR
OF THE
MUSEUM OF COMPARATIVE ZOOLOGY
AT HARVARD COLLEGE
TO THE
PRESIDENT AND FELLOWS OF HARVARD COLLEGE
FOR
1924-1925.

CAMBRIDGE, U. S. A.:
PRINTED FOR THE MUSEUM.
1925.

REPORTS ON THE SCIENTIFIC RESULTS OF THE EXPEDITION TO THE EAST-ERN TROPICAL PACIFIC, IN CHARGE OF ALEXANDER AGASSIZ, BY THE U. S. FISH COMMISSION STEAMER "ALBATROSS," FROM OCTOBER, 1904, TO MARCH, 1905, LIEUTENANT COMMANDER L. M. GARRETT, U. S. N., COMMANDING, IN PREPARATION: —

R. P. BIGELOW. The Stomatopods.

O. CARLGREN. The Actinaria.

W. R. COE. The Nemerteans.

H. J. HANSEN. The Cirripeds.

W. E. HOYLE. The Cephalopods.

P. KRUMBACH. The Sagittae.

G. W. MÜLLER. The Ostracods.

MARY J. RATHBUN. The Crustacea
Decapoda.

G. O. SARS. The Copepods.

——. Pteropods, Heteropods.

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MUSEUM OF COMPARATIVE ZOÖLOGY.

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HENRY P. WALCOTT.

JOHN E. THAYER.

GEORGE R. AGASSIZ.

SAMUEL HENSHAW, *Director.*

Officers.

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SAMUEL GARMAN . . *Curator of Fishes*

OUTRAM BANGS . . *Curator of Birds.*

HUBERT L. CLARK . . *Curator of Echinoderms.*

HENRY B. BIGELOW . . *Research Curator in Zoölogy.*

ROBERT W. SAYLES . . *Curator of the Geological Collections.*

PERCY E. RAYMOND . . *Curator of Invertebrate Palaeontology.*

THOMAS BARBOUR . . *Curator of Reptiles and Amphibians.*

RALPH V. CHAMBERLIN *Curator of Arachnids, Myriopods, and Worms.*

JOHN C. PHILLIPS . . *Research Curator of Birds.*

NATHAN BANKS . . *Curator of Insects.*

GLOVER M. ALLEN . . *Curator of Mammals.*

ARTHUR LOVERIDGE . *Associate in Zoölogy (Reptiles and Amphibians).*

JAMES L. PETERS . . *Associate in Ornithology.*

GEORGE NELSON . . *Preparator.*

GERTRUDE A. THURSTON *Secretary.*

ELEANOR K. SWEET . . *Librarian.*

REGINALD A. DALY . . *Sturgis Hooper Professor of Geology.*

REPORT.

TO THE PRESIDENT AND FELLOWS OF HARVARD COLLEGE:—

THROUGH the generosity of an "Anonymous Friend" \$50,000 has been added to the invested funds of the Museum in the hands of the Treasurer of Harvard College. The income of this Fund "is to be devoted to increasing the salaries of such of the Curators of the Museum of Comparative Zoölogy as the Faculty of the Museum may select."

The William and Adelaide Barbour Fund has been increased through generous gifts of Mrs. Rosamond P. Barbour (\$2,000) and of Mr. Frederick K. Barbour (\$1,000), and monetary gifts of several subscribers for present use have been applied for curatorial services upon the research collections of birds and other vertebrates.

These gifts to the funds and for present use are gratefully acknowledged by vote of the Corporation.

The inadequateness of resources as to services and equipment throughout the Museum has been emphasized with such monotonous frequency during recent years, that the acquisition for the ornithological department of the large room on the fifth floor, providing as it does for the immediate needs and growth of the important collection of birds, is in all respects most satisfactory.

Designed originally, forty-two years ago, for a lecture room, and so used for the biological courses during many years, it was later given over for advanced zoölogical research. The size of the room precluded its economical usage for research; its situation and the nature of present-day zoölogical studies involved a most undesirable hazard as to the safety of the collections and library, and necessarily limited the general use of the room during all hours, not infrequently curtailing the opportunities for advanced research. Its relinquishment to the Museum by the Department of Zoölogy has involved a number of changes and rearrangements as to rooms and equipment; with the consent of the Corporation, the Museum

was able to bear a part of the expense of these changes, through its credit balance.

From the Museum standpoint, the more important of these readjustments are:—the actual removal of all laboratory work from the fifth floor, the only exception is the use of one small room by advanced Radcliffe students; the alteration of the lecture room on the first floor; and the transfer of the instruction in histology and anatomy from the fourth to the first floor. Of the three large lecture rooms on the first floor of the University Museum, the one in the Museum of Comparative Zoölogy, the first to be built, was used, until the completion of the Botanical and Geological sections of the Museum, for biological and geological instruction. With more modern facilities, these later-built lecture rooms have in recent years taken over most of the oral instruction given in the larger zoölogical courses, and consequently the original use of the room has been very limited. The alteration of lecture room into laboratory will give improved modern facilities for instruction and a better concentration of students; the utilization of the central part of the room affords the opportunity for lectures and demonstration to small groups of students. Professor Ames, by granting the temporary use of space in the Botanical Museum, and in other ways, has given his cordial coöperation toward the fulfilment of these improvements.

Dr. H. B. Bigelow has continued in charge of the explorations in the Gulf of Maine and in Massachusetts Bay, carried on in coöperation with the U. S. Bureau of Fisheries; the data already gathered concerning migration, surface drift, serial temperatures, etc., foretell economic results bearing upon the life habits of important food fishes.

The field-work of Dr. J. C. Phillips in Africa and of Mr. J. L. Peters in the West Indies (Martinique, Saint Lucia, and Saint Vincent) added large collections, principally birds and mammals, to the Museum series. The skeleton of a White Rhinoceros (*Ceratotherium simum* (Burchell)) is included among the more notable specimens secured by Dr. Phillips.

Dr. Thomas Barbour, during a three month's stay in Central America and Cuba, neglected no opportunity to increase the size

and value of the Museum's collections, limiting his collections, as always, to no one department.

To secure certain Mexican species, Mr. John E. Thayer very generously engaged the services of Mr. W. W. Brown, whose success in ferreting out rare local forms is unequalled. The series of birds and mammals secured by Mr. Brown has full data and is, as usual, prepared with his unsurpassed expertness.

Prof. P. E. Raymond had charge of the geological field-work in the Harvard Summer School during 1924. With Banff as a base for the School, collections were made in Alberta, British Columbia, and Manitoba, and many fossils were secured from localities not previously well represented in the Museum series. Permission to collect in the Canadian National Parks was most courteously granted by the Hon. J. B. Harkin, the Commissioner of Parks, and several of the students of the School very generously added their most desirable specimens to those secured by Professor Raymond.

Though with a wholly inadequate equipment for a satisfactory arrangement, Dr. G. M. Allen, working as in recent years on a part-time basis, maintains the research collection of mammals in correct sequence, well labeled, and easily accessible at all times for properly qualified students. His work upon the mammals collected during the Asiatic expeditions under Mr. R. C. Andrews, in coöperation with the American Museum of Natural History, is making satisfactory progress. From this source more than 300 skins and skulls of Chinese and Mongolian insectivores and rodents have been added to the Museum collection. Dr. Allen has also completed this year the study of and report upon the squirrels, hamsters, and jerboas collected by the expedition.

For nearly twenty-five years, since October 1900, Mr. Outram Bangs has cared for the research collection of birds. During this time, the collection has increased from a position of comparative unimportance to one that is unsurpassed among university collections, and which ranks among American collections with the first in size, while unequalled in representatives of world-wide genera and species. Almost single handed, Mr. Bangs has brought this immense series of bird skins to such condition that, barring the inevitable misplacement of a specimen incident to every day

use, any skin is at once readily accessible. It is only through this perfectness of arrangement and its maintenance that Mr. Bangs is able to comply with the ever-increasing number of applications for the loan of material. Mr. Bangs spent several weeks in England and continental Europe, working in museums in Berlin, Paris, Tring, and London, noting their *lacunae* and their material available for exchange.

The card catalogue of the collection of bird skins has been continued by Mr. James L. Peters. He reports that during the year he has completed the record of twenty-one (21) families, containing 281 species and 4,710 specimens. The number catalogued to 1 August, 1925 is fifty-seven (57) families, 1,072 species, and 22,310 specimens.

The care, storage, and accessibility of the less specialized vertebrates involve methods other than those suitable for birds and mammals. For the most part preserved in alcohol, the Museum's collections of reptiles, amphibians, and fishes are stored, as are the other alcoholic collections, with the exception of those shown in the exhibition rooms and such as are temporarily removed for study, in the basement of the northeasterly section of the Museum. With the exception of the ceiling of one of the rooms, the walls, floors, and ceilings of all the rooms of this section are of brick, and the basement is equipped with sprinklers.

Dr. Barbour and Mr. Arthur Loveridge, during the year, have thoroughly overhauled and rearranged a very considerable part of the collection of amphibians and reptiles; the accessions to these collections through gift, exchange, and purchase, have been unusually large.

Mr. Garman, in his report upon the year's work, states that the collection of fishes has been cared for as in recent years and has been increased by a number of rarities collected by Dr. Barbour.

Mr. Nelson completed the mount of *Moropus elatus* Marsh and has remounted the exhibition series (skins and skeletons) of marsupials and edentates in the systematic collection.

The Museum is indebted to Miss E. B. Bryant for her work upon the collection of spiders, and for assistance in many ways to Mr. Banks.

The collections of every department benefit each year from Dr. Barbour's interest and generosity. His more noteworthy gifts this year, other than those of reptiles and amphibians, include the Robert Wilson collection of fossils from the phosphate beds near Charleston, S. C.; a fine series of Cuban Chrysopidae, with a number of types; Professor Sushkin's private collection of bird skins; large series of bird skins from New Zealand, Norfolk Island, Australia, New Guinea, Madagascar, South Africa, Argentina, Cuba, and from many European countries; also series of mammalian bones from Porto Rican caves, and very many skins with skulls selected to fill gaps in the Museum series.

The Museum is also indebted to

Mr. Isidor Morse for a number of skulls of Asiatic game mammals, with antlers or horns of exceptional size.

To Miss A. M. Alexander for specimens of the Hawaiian Rat (*Rattus hawaiiensis* Stone).

To Mr. F. S. Mead for finely prepared skins of Ptarmigan and Black Game from Scotland.

To the American Museum of Natural History (Dr. L. C. Sanford) for bird skins from the Whitney South Sea Expedition.

To Mrs. George R. Agassiz for a specimen of *Drenanaspis gemuendenensis* Schlüter from the Lower Devonian of Bundanback, Germany.

To Mr. F. C. Bowditch for another large series of Chrysomelidae (leaf beetles).

To Mr. C. B. Wilson for a named series of copepods.

To Mr. W. F. Clapp for several interesting shells.

To the South African Fisheries Board for a number of Echini, including paratypes of newly described species.

To the Trustees of the British Museum for a series of Echini, including genera and species not previously represented in the Museum Collection.

Mammal skins with skulls from the coast and islands of Lower California, the Denton series of Moa bones, and many single specimens or series of insects, birds, and mammals, have been purchased. The income of the William and Adelaide Barbour Fund has also aided field-work in the West Indies.

The library has received as a gift of Prof. M. A. Menzbier a complete set of the *Messenger ornithologique*, and former Governor W. C. Forbes has presented an interesting sheet of some correspondence between Ralph Waldo Emerson and Louis Agassiz (*cf.* Mrs. E. C. Agassiz's *Louis Agassiz*, vol. 2, p. 620).

The alcyonarians collected during the ALBATROSS expeditions of 1891 and 1904-1905, and sent many years ago to the late Prof. Theophil Studer in Berne, have been returned. Professor Studer was evidently unable to study the collection; it is, however, in good condition.

The Library contains 62,955 volumes, and 70,562 pamphlets; 911 volumes and 1,803 pamphlets have been received during the year.

The publications for the year include one number of the *Memoirs*, nine numbers of the *Bulletin*, and the *Annual Report*, a total of 710 (76 quarto and 634 octavo) pages, illustrated by 38 (11 quarto and 27 octavo) plates.

SAMUEL HENSHAW,
Director.

REPORT ON THE MAMMALS.

BY OUTRAM BANGS.

About 1,000 specimens have been added to the collection during the year.

The more noteworthy of these accessions are a series of 300 Asiatic skins and skulls from the American Museum of Natural History; 200 Mexican skins and skulls collected by Mr. W. W. Brown, the gift of Col. J. E. Thayer; a number of skulls of Asiatic game animals, many with antlers or horns of exceptional size, presented by Mr. Isidor Morse; skins and skulls and heads of African game animals, the gift of Dr. and Mrs. J. C. Phillips, and Mr. J. C. Phillips, Jr.; a large number of skins, skulls, alcoholics, and fossils, given by Dr. Thomas Barbour.

Small series or single specimens have been received from the Boston Society of Natural History, Peabody Museum of American Archaeology and Ethnology, Peabody Museum (Salem), Miss A. M. Alexander, Messrs. A. T. Abernethy, G. M. Allen, Joseph Bequaert, W. F. Collins, Herbert Friedmann, A. B. Howell, R. W. Johnson, E. R. Jump, Arthur Loveridge, George Nelson, J. L. Peters, William Rowan, E. M. Schlaikjer, George Schwab, R. P. Strong, A. M. Tozzer, C. A. Weare, R. C. Wheeler, and S. B. Wolbach.

Many exchanges have been made with the American Museum of Natural History, Dresden Museum, Field Museum of Natural History, and the U. S. National Museum.

REPORT ON THE BIRDS.

BY OUTRAM BANGS.

During the year 3,621 specimens were received, including seventy-one genera new to the collection.

Of the more notable additions the following may be mentioned:—121 specimens taken by Mr. W. W. Brown in San Luis Potosi, and Tamaulipas, and 399 in the state of Vera Cruz, Mexico. Among the rarities in these collections are good series of the much desired species *Hylorchilus sumichrasti*, *Spizella wortheni*, and *Vermivora crissalis*. For Mr. Brown's work in Mexico the Museum is indebted to the liberality of Col. John E. Thayer.

Due to Dr. Thomas Barbour's generosity, the Museum acquired a series of 165 specimens, a part of the private collection of Prof. P. P. Sushkin, an extremely interesting collection from southwestern New Guinea, and others from Argentina and South Africa; also smaller series from Cuba, Chile, British Guiana, Madagascar, New Zealand, Norfolk Island, Australia, Fiji, and many other localities.

Dr. John C. Phillips, working in the Lake Region of the eastern Congo and southwestern Uganda, secured 744 specimens, a large number of which are new to the collection.

Mr. J. L. Peters, aided by the William and Adelaide Barbour Fund, and the generosity of Dr. Thomas Barbour, collected in St. Lucia, Martinique, and St. Vincent; he was most successful in securing a representative series of the birds, including the great rarities *Catharopeza bishopi*, *Myadestes sibilans*, and *Myiarchus sclateri*.

A series of eighty-seven specimens collected by the Whitney South Sea Expedition was received from the American Museum of Natural History, through the kind interest of Dr. L. C. Sanford, and the Museum is indebted to Mr. F. S. Mead, Mr. E. H. Litch-

field, and Lord Lovat for a series of Scotch Ptarmigan and British Black Grouse.

Single specimens or small series have been given by the American Museum of Natural History, Boston Society of Natural History, Colorado Museum, Museu Paulista, Peabody Museum (Salem, Mass.), and Messrs. Thomas Barbour, E. H. Forbush, F. H. Kennard, G. v. D. Meer, J. L. Peters, J. C. Phillips, P. P. Sushkin, G. H. Thayer, J. E. Thayer, and C. W. Townsend.

A few specimens have been secured by purchase, and nearly 500 have been obtained by exchange.

An unusually large number of requests for the loan of material were received.

Professor Sushkin's coöperation, during his stay of several weeks, is acknowledged with gratitude.

REPORT ON THE REPTILES AND AMPHIBIANS.

BY THOMAS BARBOUR.

I was absent during February, March, and April of this year, visiting laboratories and plantations, and doing some collecting in Central America and Cuba.

With the assistance of the United Fruit Company, an intensive census has been made of the snakes of the district about Tela in Honduras, where there have been a number of fatalities from snake poisoning. This has been undertaken to ascertain the relative numerical abundance of the various poisonous snakes. Several thousand specimens have been examined.

During the year the Loveridge collection of African amphibians was received, and Mr. Loveridge prepared a report upon the same. Mr. Loveridge has continued his careful and painstaking work on the study series; nearly 4,000 specimens have been labeled and card indexed, and about 400 trays of study material have been overhauled, labels rewritten, jars cleaned, and refilled with fresh alcohol where necessary. An enormous amount of routine identifying has also been done.

A larger amount of material than usual has been received during the year, and an unusually large number of exchanges were successfully effected.

Material has been purchased from Don Carlos Reed in Chile, and from a number of other sources.

The following gifts should be especially mentioned: —

A magnificent series of Brazilian snakes from Dr. Afranio do Amaral; an excellent series of reptiles and amphibians from southern Siam from Mr. C. J. Aagaard; and some rare southwestern reptiles from Mr. L. M. Klauber, in exchange for living eastern material.

Thanks are due to the following persons for gifts: — Messrs.

J. S. Alexander, Joseph Bequaert, H. S. Blair, F. N. Blanchard, W. S. Brooks, R. V. Chamberlin, Herbert Friedmann, J. P. Jones, C. R. Kellogg, C. H. Lankester, Arthur Loveridge, George Nelson, T. E. Penard, J. L. Peters, J. C. Phillips, Alipio de Miranda-Ribeiro, William Rowan, G. O. Shattuck, J. B. Shropshire, J. E. Thayer, H. H. Wilder, James Zetek, and the Charleston Museum.

The synopsis appended shows the gain in number of genera and species as compared with 1923-1924. In comparing the figures given with the number of species recognized in Boulenger's catalogue, it should be emphasized that the number of species described since the publication of the catalogue has, in some of the groups been large.

	Species recognized in Boulenger's Catalogues	Genera		Species		Gain in 1923-4	Genera 1924-5	Gain in 1923-4	Species 1924-5
		1923-4	1924-5	1923-4	1924-5				
Rhynchocephalia	1	1	1	1	1	0	0	0	0
Crocodylia	20	6	6	19	19	0	0	1	0
Chelonia	201	45	50	150	160	4	5	3	10
Lacertilia	1,616	234	256	1,346	1,482	8	22	29	136
Ophidia	1,327	158 ¹	264	1,045	1,086	9	106	25	42
Amphibia Apoda	32	11	13	23	25	1	2	4	2
" Urodela	98	35	35	142	146	0	1	2	4
" Salientia	800	126	138	788	846	11	12	57	58
Total	4,095	616	763	3,514	3,765	33	148	121	252

Bufo	—	—	96	101	—	—	5
Hyla	—	—	117	122	—	—	5
Rana	—	—	142	159	—	—	17

¹ Error of 100 made previously.

REPORT ON THE FISHES.

BY SAMUEL GARMAN.

As in former years the collection has been increased by a number of rarities received from Dr. Barbour.

The greatest amount of work done has been in the care of the collection, in the renewal of preservatives that have evaporated, and in the withdrawal of duplicates that have been rendered valueless from loss of coloration.

In connection with this work, studies of the records and descriptions in the older literature, and of comparisons with those supposed to have been of later discoveries, were constant.

REPORT ON THE ENTOMOLOGICAL DEPARTMENT.

BY NATHAN BANKS.

Additions to the collection were presented by Miss E. B. Bryant, and Messrs. Thomas Barbour, Joseph Bequaert, S. E. Cassino, M. L. Fernald, L. G. Gentner, A. B. Hungerford, C. W. Johnson, Arthur Loveridge, A. P. Morse, George Nelson, C. H. Paige, George Salt, and J. Steinbach. Notable was the fine series of Cuban Chrysopidae, including over twenty types, given by Dr. Barbour. Exchanges were made with Messrs. James McDunnough and Charles Schaeffer.

Fully half of the year was spent mounting, labeling, and assorting the Panama collection, which amounts to fully 15,000 specimens. Two families of Hymenoptera, the termites, myriopods, and many spiders of this collection have been named. Mr. Johnson is studying the Diptera, and Professor Metcalf the Fulgoridae.

Labels were placed on several thousand specimens, and over 300 types were verified and marked. The Mutillidae, Larridae, and Sphegidae have been brought together in new Schmitt boxes, and nearly one half of the Banks Diptera has been united with the main collection. Dr. Snyder returned the Solomon Island termites with fourteen types, and Professor Metcalf the miscellaneous Fulgoridae with seven types.

Seven lots of specimens have been identified for others, the material retained adding to the collection. Besides numerous visits from local entomologists, there were six other visitors.

The usual inspections of the collection show that it is in good condition.

REPORT ON THE MYRIOPODS, ARACHNIDS, AND WORMS.

BY RALPH V. CHAMBERLIN.

During the first part of the year several collections of chilopods and diplopods from Central America were studied. Among these was a fine lot collected in Honduras and British Honduras by Mr. W. L. Schmidt, and submitted through the courtesy of the Field Museum of Natural History; and a collection made on Barro Colorado Island by Mr. W. C. Allee, and on this Island and other parts of the Canal Zone by Mr. James Zetek. Other collections studied and reported upon include one from the Hawaiian Islands received from the Bishop Museum, one from Arizona made by Mr. H. F. Loomis, another from southern Utah made by the Curator.

The latter part of the year was devoted largely to clearing up many small lots of material, especially specimens submitted from time to time by the U. S. Horticultural Board, the Biological Survey, and the Bureau of Entomology. The entire collection of Illinois chilopods and diplopods belonging to the Illinois Natural History Survey was studied, and nearly all identified and labeled. Other Illinois collections studied at the same time were made by Miss Margaret Windsor, Messrs. Irving Blake and A. M. Holmquist.

During the year some time was also given to the arachnids; several collections of Central and North American species were identified and a report upon new forms was prepared. A study of *Coelotes* and *Coras* was made and a paper prepared on the results.

Additions to the collections were received from the following sources: — Miss Margaret Windsor, Messrs. W. C. Allee, Gilbert Archey, W. J. Baerg, C. F. Baker, P. L. Boone, J. C. Chamberlin,

C. R. Crosby, J. J. Davis, R. V. Ellis, R. P. Erwin, F. Felippone, T. H. Frison, A. M. Holmquist, F. Johansen, H. F. Loomis, James McDunnough, R. C. MacGregor, J. P. Moore, R. D. Rands, W. L. Schmidt, T. E. Snyder, V. M. Tanner, James Zetek, Bernice P. Bishop Museum (through Mr. E. H. Bryan, Jr.), Field Museum of Natural History, U. S. Horticultural Board, Bureau of Biological Survey, and Bureau of Entomology.

REPORT ON THE ECHINODERMS.

BY HUBERT LYMAN CLARK.

The first part of the year was spent in the preparation of the manuscript for a catalogue of the Recent Echini of the British Museum, a continuation of the work done in London during the previous three months. After this manuscript was completed, a report on a collection of sea-stars from South Africa was prepared for the Fisheries and Marine Biological Survey of the Union of South Africa. The remainder of the year was spent in arranging, labeling, and cataloguing the collection of sea-urchins to correspond with the British Museum catalogue. This involved the rewriting of many labels and catalogue cards. At the same time all type material was conspicuously designated. It may be noted that the collection contains type material of 210 of the 480 species represented in the collection.

The chief accessions of the year were received in return for the work done on the British and South African collections above mentioned. From the British Museum, seventy-six sea-urchins, representing forty-five much desired species, of which eighteen were new to the collection, have been received; of these, five belong to genera not hitherto represented. The South African Fisheries Board donated forty-six specimens of twenty-one species of sea-stars, of which eight were new to the collection; of these, four are paratypes of species hitherto undescribed. For twenty-two other echinoderms, belonging to a dozen species, thanks are due the Australian Museum, Messrs. F. C. Adams, Thomas Barbour, R. T. Jackson, W. H. Longley, G. H. Parker, and D. H. Tennent.

REPORT ON THE COELENTERATES.

BY HENRY B. BIGELOW.

The most interesting accessions to the collection are Medusae from Bering Sea, contributed by Capt. R. A. Bartlett, and a large series of the fresh-water Medusa *Craspedacusta* from Gatun Lake, Panama Canal Zone, presented by Dr. Thomas Barbour.

Thanks are also due Prof. E. L. Mark for Medusae from Bermuda, Capt. G. W. Carlson for local Medusae, and the U. S. National Museum for Medusae.

In connection with the explorations of the Gulf of Maine, the FISH HAWK carried out an extensive program of towing, with serial temperatures, in Massachusetts Bay, during the winter and spring, also setting out drift bottles, a large proportion of which has been recovered, outlining the dominant drift of the surface water of the Bay.

The tagging of Cod, Pollock, and Haddock has been continued, with Mr. W. C. Schroeder of the Bureau, in immediate charge. About 33,000 fish have been tagged up to date, about 3% of those tagged in 1923 having been recovered, 5% of those tagged in 1924, and 3½% of those tagged in 1925. While it is too early for a general statement of results, enough data has been gathered to show that the Cod in different regions differ widely in their migrations.

At the recommendation of the North American Committee on Fisheries Investigations, the program of tagging has been expanded to include the Mackerel, about 5,000 having been tagged at Woods Hole, Provincetown, and Boothbay, during the past summer, with about 300 recoveries to date.

The physical study of the waters of the Gulf has also been continued by a number of serial temperatures taken on the Fishing Banks, by the HALCYON, those for Nantucket Shoals proving a valuable addition to knowledge of thermal conditions there.

Mr. Schroeder has carried on his investigations on the Cod; Mr. E. F. B. Fries has continued his study of the Sagittae collected by the International Ice Patrol in the region of the Grand Banks; and Lieut. Commander E. H. Smith has published, as Bulletin No. 12, U. S. Coast Guard, the report on the oceanographic work of the Patrol for 1924.

Most of my time has been devoted to the reports on the Gulf of Maine, (*cf.* Report M. C. Z., 1923-1924, p. 20-21). The account of the fishes has been published, (Bull. 40, part 1, U. S. Bur. fish.); the account of the physical oceanography is nearing completion.

REPORT ON INVERTEBRATE PALAEONTOLOGY.

BY P. E. RAYMOND.

The Curator was in charge of the Harvard Summer School course in field geology in 1924, and in connection with that work was able to make collections from a region not previously well represented in the Museum. Several of the students in the course, notably Mr. Joseph P. Day, Jr., Mr. H. C. Stetson, Mr. D. H. Leavitt, and Mr. John Yerxa, generously presented to the Museum their most desirable specimens. Fossils were obtained from the Lower Cambrian near Lake Louise, Alberta, the Middle Cambrian at Ross Lake, Mt. Stephen, and Burgess Pass, B. C., the Upper Cambrian, Devonian, and Triassic near Massive, Alberta, and the Mississippian and Pennsylvanian at Lake Minnewanka and Banff, Alberta. Notable among the fossils was a new fish of the genus *Belonorhynchus* found by Mr. Day in the Triassic at Massive. This genus had not previously been reported as occurring in America. The Museum is indebted to the Hon. J. B. Harkin, Commissioner of Parks, for permission to collect fossils in the Canadian National Parks.

In August a visit was paid to the outcrops of the Edmonton strata in the Red Deer valley in the vicinity of Drumheller and Munson, Alberta. A collection of fresh and brackish water Mollusca of late Cretaceous age was made at these localities. Later on a week was spent collecting from the Upper Cambrian and Lower Ordovician in the vicinity of Golden, B. C., and finally, a visit was paid to the Upper Ordovician outcrops at Stoney Mountain, near Winnipeg, Manitoba.

Considerable time was devoted this year to the rearrangement of the collections, with the view of obtaining much needed space for storage. The Ordovician brachiopods collected in Virginia and Tennessee in 1917, 1918, and 1921 were studied and labeled,

and descriptions written of the species from the Athens and Lenoir formations. This, with the work done on the brachiopods of the Holston and Ottosee by Dr. Bradford Willard, completes the study of this group, and the greater part of the palaeontological work of the Shaler Memorial Expeditions to the Appalachians.

In addition to the collections obtained by the Curator, the following donations have been received:— from the Smithsonian Institution, through Dr. Resser, two trilobites; from Mr. J. A. MacDonell, Upper Pennsylvanian fossils from Oklahoma; from Dr. Thomas Barbour, Mollusca from the Miocene at Charleston, South Carolina, and from the Cretaceous at Soledad, Cienfuegos, Cuba; from Mr. D. H. Leavitt, Pennsylvanian fossils from opposite South Bend, Nebraska.

REPORT ON THE GEOLOGICAL COLLECTIONS.

BY R. W. SAYLES.

Additions to the collection include from Prof. Eliot Blackwelder specimens of tillite of Cambrian or Pre-Cambrian age from Little Mountain in Great Salt Lake, Utah, discovered by Professor Blackwelder during the summer of 1924; from Prof. W. M. Davis Huronian tillite and banded slate from Cobalt, Ontario, and a few fragmentary specimens, (jaws and skulls), of Miocene mammals, purchased of Mr. E. M. Schlaikjer, and collected by him in South Dakota.

The Curator has been engaged in working up the results of investigations on the geology of Bermuda, and preparing a report for the National Research Council on the progress of the study of seasonal banding for the year 1924. At the last annual meeting of the Geological Society of America a paper on Pleistocene Bermuda was submitted by the writer and Prof. T. H. Clark.

REPORT ON THE LIBRARY

During the Museum year from August 1, 1924, to July 31, 1925, inclusive, 911 volumes, 1,624 parts of volumes, and 1,803 pamphlets have been added to the Library.

The total number of volumes in the Library is 62,955, the total number of pamphlets is 70,562.

Three hundred and ninety-four volumes have been bound; one thousand five hundred pamphlets have been separately bound.

From the Harvard College Library the Museum has received 147 titles; other contributors are W. M. Wheeler (720 titles), Nathan Banks (161 titles), W. M. Davis (122 titles), Samuel Henshaw (89 titles), Outram Bangs (59 titles), Thomas Barbour (54 titles), Carl Attems (33 titles), H. B. Bigelow (32 titles), Peabody Museum of American Archaeology and Ethnology (24 titles).

PUBLICATIONS

FOR THE YEAR 1924-1925.

(1 AUGUST, 1924 — 31 JULY, 1925).

MUSEUM OF COMPARATIVE ZOÖLOGY.

BULLETIN:—

Vol. LVII.

No. 7. The Ethopolidae of America north of Mexico. By Ralph V. Chamberlin. 56 pp. 6 plates. April, 1925.

No. 8. The genera *Lithobius*, *Neolithobius*, *Gonibius*, and *Zinapolys* in America north of Mexico. By Ralph V. Chamberlin. 66 pp. 3 plates. June, 1925.

Vol. LXVI.

Part 2. The birds of the Lake Umbagog region of Maine. By William Brewster. 192 pp. February, 1925.

Vol. LXVII.

No. 1. Some trilobites of the Lower Middle Ordovician of eastern North America. By Percy E. Raymond. 180 pp. 10 plates. April, 1925.

No. 2. The systematic position of *Palaeospiza bella* Allen, with observations on other fossil birds. By Alexander Wetmore. 14 pp. 4 plates. May, 1925.

No. 3. The Henry Bryant types of birds. By Outram Bangs and Thomas E. Penard. 14 pp. June, 1925.

No. 4. Diagnoses of new American Arachnida. By Ralph V. Chamberlin. 40 pp. July, 1925.

No. 5. Burmeister's porpoise (*Phocaena spinipinnis*). By Glover M. Allen. 14 pp. 4 plates. July, 1925.

No. 6. Description of a new *Psithyrus*, with an account of *Psithyrus laboriosus*, and notes on bumblebees. By Joseph Bequaert and Otto E. Plath. 26 pp. July, 1925.

MEMOIRS:—

Vol. XLVII.

No. 5. Reports on the results of dredging by the U. S. Coast Survey Steamer "Blake." XLVIII. Les macroures marcheurs. Par E. L. Bouvier. 76 pp. 11 plates. January, 1925.

REPORT:—

• 1923-1924. 32 pp. December, 1924.

ALLEN, G. M.

The *Delphinus occiduus* of Leidy. *Journ. mammalogy*, August, 1924, **5**, p. 194-195.

Microtines collected by the Asiatic expeditions. *Amer. mus. novitates*, 30 September, 1924, no. 133, 13 pp.

The Bridled Dolphin (*Prodelphinus froenatus*) on the Florida coast. *Journ. mammalogy*, February, 1925, **6**, p. 59.

Jerboas from Mongolia. *Amer. mus. novitates*, 31 March, 1925, no. 161, 6 pp.

Squirrels collected by the American museum Asiatic expeditions. *Amer. mus. novitates*, 2 April, 1925, no. 163, 16 pp.

Hamsters collected by the American museum Asiatic expeditions. *Amer. mus. novitates*, 23 June, 1925, no. 179, 7 pp.

See also p. 25, *Bull.* **67**, no. 5.

BANGS, OUTRAM.

A new blue water-thrush from China. [With T. E. Penard]. *Occ. papers Boston soc. nat. hist.*, 27 February, 1925, **5**, p. 147.

The history and characters of *Vermivora crissalis* (Salvin and Godman). *Auk*, April, 1925, **42**, p. 251-253.

See also p. 25, *Bull.* **67**, no. 3.

BANKS, NATHAN.

Neuroptera from the Williams Galapagos expedition. *Zoologica*, 8 November, 1924, **5**, p. 177-180.

BARBOUR, THOMAS.

A new *Gymnophis* from Colombia. *Proc. Biol. soc. Washington*, 7 August, 1924, **37**, p. 125-126.

Notes on some Central American snakes. [With Afranio do Amaral]. *Occ. papers Boston soc. nat. hist.*, 12 September, 1924, **5**, p. 129-132.

Biology at Harvard. *Harvard grad. mag.*, September, 1924, **33**, p. 94-97.

More about Harvard biology. *Harvard alumni bull.*, 13 November, 1924, **27**, p. 211-213.

A Yunnan Gecko. *Occ. papers Boston soc. nat. hist.*, 29 December, 1924, **5**, p. 133-135.

Tropical research institute at Harvard. *Harvard alumni bull.*, 1 January, 1925, **27**, p. 419-421.

Notes on *Grypiscus*. *Copeia*, 26 January, 1925, no. 138, p. 8.

An ornithological enigma. *Auk*, January, 1925, **42**, p. 132.

A new frog and a new snake from Panama. *Occ. papers Boston soc. nat. hist.*, 24 June, 1925, **5**, p. 155-156.

A new Cuban Anolis. *Occ. papers Boston soc. nat. hist.*, 24 June, 1925, **5**, p. 167-168.

New neotropical lizards. *Proc. Biol. soc. Washington*, 25 July, 1925, **38**, p. 101-102.

BIGELOW, H. B.

Fishes of the Gulf of Maine. [With W. W. Welsh]. *Bull. U. S. bur. fish.*, 1924, (1925), **40**, pt. 1, 567 pp.

CHAMBERLIN, R. V.

Report on the Chilopoda and Diplopoda collected by the Barbados-Antigua expedition from the University of Iowa in 1918. *Univ. Iowa studies nat. hist.*, 1 August, 1924, **10**, no. 4, p. 41-44.

A new clubionid spider of the genus *Phruronellus* from California. *Proc. Biol. soc. Washington*, 27 January, 1925, **38**, p. 7-8.

Notes on chilopods and diplopods from Barro Colorado Id., and other parts of the Canal Zone, with diagnoses of new species. *Proc. Biol. soc. Washington*, 12 March, 1925, **38**, p. 35-44.

A new lithobiomorphus chilopod from Uruguay. *Ent. news*, April, 1925, **36**, p. 120-121.

See also p. 25, *Bull.* **57**, no. 7, 8, **67**, no. 4.

CLARK, H. L.

Echinoderms from the South African fisheries and marine biological survey. Part 1. Sea-urchins (Echinoidea). *Fish. and mar. biol. surv. Union South Africa*, 10 September, 1924, *Rept.* 4, *Spec. rept.* 1, p. 1-16, pl. 1-4.

A catalogue of the recent sea-urchins (Echinoidea) in the collection of the British Museum (Natural history). London, 1925, 28, 250 pp., 12 pls.

LOVERIDGE, ARTHUR.

A new snake of the genus *Lampropeltis*. *Occ. papers Boston soc. nat. hist.*, 29 December, 1924, **5**, p. 137-139.

Notes on East African scorpions and Solifugae, collected 1916-1923. *Proc. Zool. soc. London*, April, 1925, p. 303-309.

PETERS, J. L.

Notes on the taxonomy of *Ardea canadensis* Linné. *Auk*, January, 1925, **42**, p. 120-122.

A review of the limpkins (*Aramus Vieillot*). *Occ. papers Boston soc. nat. hist.*, 30 January, 1925, **5**, p. 141-144.

A new *Geositta* from western Argentina. *Occ. papers Boston soc. nat. hist.*, 30 January, 1925, **5**, p. 145.

PHILLIPS, J. C.

Harvard men in Africa. *Harvard alumni bull.*, 22 January, 1925, **27**, p. 497-502.

Trained African elephants. *Journ. mammalogy*, May, 1925, **6**, p. 130-131.

Leonard Baldner, seventeenth century sportsman and naturalist. *Auk*, July, 1925, **42**, p. 332-341, pl. 17.

A natural history of the ducks. Vol. 3. Boston, etc., 1925, [11], 383 pp., pl. 45-70, map 66-95.

RAYMOND, P. E.

The oldest coral reef. *14th Rept. State geol. Vermont*, 1923-1924 (1924), p. 72-76, pl. 1.

New Upper Cambrian and Lower Ordovician trilobites from Vermont. *14th Rept. State geol. Vermont*, 1923-1924 (1924), p. 137-203, pl. 12-14.

See also p. 25, *Bull.* **67**, no. 1.

SAYLES, R. W.

Pleistocene Bermuda. (Abstract). [With T. H. Clark]. *Bull. Geol. soc. Amer.*, March, 1925, **36**, p. 141-142.

Researches in sedimentation in 1924. *Rept. Comm. sedimentation Nat. research council*, 1925, p. 38-43.

INVESTED FUNDS OF THE MUSEUM.

IN THE HANDS OF THE TREASURER OF HARVARD COLLEGE.

Gray Fund (1859)	\$50,000.00
Permanent Fund (1859)	117,469.34
Sturgis Hooper Fund (1865)	108,476.69
Humboldt Fund (1869)	9,659.35
Agassiz Memorial Fund (1875)	297,933.10
Teachers and Pupils Fund (1875)	7,594.01
Virginia Barret Gibbs Fund (1892)	8,584.08
Willard Peele Hunnewell Memorial Fund (1901)	5,666.24
Maria Whitney Fund (1907)	7,781.23
Alexander Agassiz Fund (1910)	99,500.00
Alexander Agassiz Expedition Fund (1910)	103,405.58
George Russell Agassiz Fund (1911)	50,000.00
George Russell Agassiz Fund. Special (1912)	50,000.00
Maria Whitney and James Lyman Whitney Fund (1912)	1,069.37
Louis Cabot Fund (1917)	6,348.02
Harvard Endowment Fund (1917)	1,000.00
William and Adelaide Barbour Fund (1923)	18,027.50
William Brewster Fund (1924)	60,134.15
Anonymous No. 7 Fund (1925)	50,063.31
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	\$1,052,711.97

The payments on account of the Museum are made by the Bursar of Harvard University, on vouchers approved by the Director. The accounts are annually examined by a committee of the Overseers. The income of funds which are restricted is annually charged in an analysis of the accounts, with vouchers, to the payment of which the incomes are applicable.

The income of the Gray Fund can be applied to the purchase and maintenance of collections, but not for salaries.

The income of the Humboldt Fund (about \$500.) can be applied for the benefit of one or more students of Natural History, either at the Museum, the United States Fish Commission Station at Woods Hole, the Stations at Bermuda, or the Tortugas.

The income of the Virginia Barret Gibbs Scholarship Fund, of the value of \$400., is assigned annually with the approval of the Faculty of the Museum, on the recommendation of the Professors of Zoölogy and of Comparative Anatomy in Harvard University, "in supporting or assisting to support one or more students who may have shown decided talents in Zoölogy, and preferably in the direction of Marine Zoölogy."

Applications for the tables reserved for advanced students at the Woods Hole Station should be made to the Faculty of the Museum before the 1st of May. Applicants should state their qualifications, and indicate the course of study they intend to pursue.

The income of the Whitney Funds can be applied for the care (binding) and increase of the Whitney Library.

The Alexander Agassiz Expedition Fund was bequeathed by Alexander Agassiz for the publication of reports on collections brought together by the expeditions with which he was connected.

The income of the Louis Cabot Fund can be applied to the purchase of books on travel, sport, and natural history.

The income of the William and Adelaide Barbour Fund is "expended wholly at the discretion of the Director of the Museum of Comparative Zoölogy * * * to increase the collections of the Museum either by exploration or the purchase of desirable material."

Three quarters of the income of the William Brewster Fund can be used for the salary of a competent ornithologist and one quarter "at the discretion of the Director of the Museum for the increase of the collection by purchase, or for the renewal or repair of the cases, or for the publication of matter contained in my manuscripts."

The income of Anonymous No. 7 Fund is devoted to increasing the salaries of such of the curators as the Faculty of the Museum may select.

The following Publications of the Museum of Comparative Zoölogy are in preparation:—

Reports on the Results of Dredging Operations in 1877, 1878, 1879, and 1880, in charge of ALEXANDER AGASSIZ, by the U. S. Coast Survey Steamer "Blake," as follows:—

A. E. VERRILL. The Alcyonaria of the "Blake."

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer "Albatross," Lieutenant Commander Z. L. TANNER, U. S. N., commanding, in charge of ALEXANDER AGASSIZ, as follows:—

K. BRANDT. The Sagittae.

K. BRANDT. The Thalassicolae.

O. CARLGREN. The Actinarians.

W. R. COE. The Nemerteans.

REINHARD DOHRN. The Eyes of Deep-Sea Crustacea.

H. J. HANSEN. The Cirripeds.

H. J. HANSEN. The Schizopods.

———. The Ascidians.

S. J. HICKSON. The Antipathids.

P. SCHIEMENZ. The Pteropods and Heteropods.

H. B. WARD. The Sipunculids.

Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of ALEXANDER AGASSIZ on the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N., commanding, as follows:—

G. W. MÜLLER. The Ostracods.

MARY J. RATHBUN. The Crustacea Decapoda.

G. O. SARS. The Copepods.

L. STEJNEGER. The Reptiles.

———. The Corals, Recent and Fossil.

PUBLICATIONS
OF THE
MUSEUM OF COMPARATIVE ZOÖLOGY
AT HARVARD COLLEGE.

There have been published of the BULLETIN Vols. I. to LIV., LVI., to LXV.; of the MEMOIRS, Vols. I. to XLII., and also XLIV. to XLVIII.

Vols. LV., LXVI. and LXVII. of the BULLETIN, and Vols. XLIII., XLIX., L. and LI. of the MEMOIRS, are now in course of publication.

The BULLETIN and MEMOIRS are devoted to the publication of original work by the Officers of the Museum, of investigations carried on by students and others in the different Laboratories of Natural History, and of work by specialists based upon the Museum Collections and Explorations.

The following publications are in preparation: —

Reports on the Results of Dredging Operations from 1877 to 1880, in charge of Alexander Agassiz, by the U. S. Coast Survey Steamer "Blake," Lieut. Commander C. D. Sigsbee, U. S. N., and Commander J. R. Bartlett, U. S. N., commanding.

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer "Albatross," Lieut. Commander Z. L. Tanner, U. S. N., commanding, in charge of Alexander Agassiz.

Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of Alexander Agassiz, on the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N., commanding.

Reports on the Scientific Results of the Expedition to the Eastern Tropical Pacific, in charge of Alexander Agassiz, on the U. S. Fish Commission Steamer "Albatross," from October, 1904, to April, 1905, Lieut. Commander L. M. Garrett, U. S. N., commanding.

These publications are issued in numbers at irregular intervals. Each number of the Bulletin and of the Memoirs is sold separately. A price list of the publications of the Museum will be sent on application to the Director of the Museum of Comparative Zoölogy, Cambridge, Mass.